Blood Pressure Measurement

- Patients should be seated with back supported and arm bared and supported.
- Patients should refrain from smoking or ingesting caffeine for 30 minutes before measurement.
- Measurement should begin after at least 5 minutes of rest.
- Appropriate cuff size and calibrated equipment should be used.
- Both SBP and DBP should be recorded.
- Two or more readings should be averaged.

Advantages of Self-Measurement

- Identifies “white-coat hypertension.”
- Assesses response to medication.
- Improves adherence to treatment.
- Potentially reduces costs.
- Usually provides lower readings than those recorded in clinic. (Hypertension is defined as SBP > 135 or DBP > 85 mm Hg).

Ambulatory Measurement

- Ambulatory monitoring can provide
  - Readings throughout the day during usual activities.
  - Readings during sleep to assess nocturnal changes.
  - Measures of SBP and DBP load.
- Ambulatory readings are usually lower than in clinic. (Hypertension is defined as SBP > 135 or DBP > 85 mm Hg).

Classification of Blood Pressure for Adults

Category	SBP (mm Hg)		DBP (mm Hg)
Optimal	< 120	and	< 80
Normal	< 130	and	< 85
High-normal	130–139	or	85–89
Hypertension			
Stage 1	140–159	or	90–99
Stage 2	160–179	or	100–109
Stage 3	≥ 180	or	≥ 110

When SBP and DBP fall into different categories, use the higher category.

Recommendations for Followup Based on Initial Measurements

Initial Blood Pressure

SBP	DBP	Followup Recommended
< 130	< 85	Recheck in 2 years
130–139	85–89	Recheck in 1 year, give lifestyle advice
140–159	90–99	Confirm within 2 months, give lifestyle advice
160–179	100–109	Evaluate/refer to care within 1 month
≥ 180	≥ 110	Evaluate/refer to care within 7 days

Evaluation Objectives

- To identify known causes.
- To assess presence or absence of target organ damage and cardiovascular disease.
- To identify other risk factors or disorders that might guide treatment.

Evaluation Components

- Medical history
- Physical examination
- Routine laboratory tests
- Optional tests

Medical History

- Duration and classification of hypertension.
- Patient history of cardiovascular disease.
- Family history.
- Symptoms suggesting causes of hypertension.
- Lifestyle factors.
- Current and previous medications.

Physical Examination

- Blood pressure readings (two or more).
- Verification in contralateral arm.
- Height, weight, and waist circumference.
- Funduscopic examination.
- Examination of the neck, heart, lungs, abdomen, and extremities.
- Neurological assessment.

Laboratory Tests and Other Diagnostic Procedures

- Determine presence of target organ damage and other risk factors.
- Seek specific causes of hypertension.

Laboratory Tests Recommended Before Initiating Therapy

- Urinalysis
- Complete blood count
- Blood chemistry (potassium, sodium, creatinine, and fasting glucose)
- Lipid profile (total cholesterol and HDL cholesterol)
- 12-lead electrocardiogram

Optional Tests and Procedures

- Creatinine clearance
- Microalbuminuria
- 24-hour urinary protein
- Serum calcium
- Serum uric acid
- Fasting triglycerides
- LDL cholesterol
- Glycosolated hemoglobin
- Thyroid-stimulating hormone
- Plasma renin activity/ urinary sodium determination
- Limited echocardiography
- Ultrasonography
- Measurement of ankle/arm index

Examples of Identifiable Causes of Hypertension

- Renovascular disease
- Renal parenchymal disease
- Polycystic kidneys
- Aortic coarctation
- Pheochromocytoma
- Primary aldosteronism
- Cushing syndrome
- Hyperparathyroidism
- Exogenous causes

Components of Cardiovascular Risk in Patients With Hypertension

Major Risk Factors:

- Smoking
- Dyslipidemia
- Diabetes mellitus
- Age older than 60 years
- Sex (men or postmenopausal women)
- Family history of cardiovascular disease

Clinical Risk Factors for Stratification of Patients With Hypertension

- Heart diseases
- Stroke or transient ischemic attack
- Nephropathy
- Peripheral arterial disease
- Retinopathy

Risk Stratification

Risk Group A

- No risk factors.
- No target organ disease/clinical cardiovascular disease.

Risk Group B

- At least one risk factor, not including diabetes.
- No target organ disease/clinical cardiovascular disease.

Risk Group C

- Target organ disease/clinical cardiovascular disease and/or diabetes.
- With or without other risk factors.

Treatment Strategies and Risk Stratification

Blood Pressure Stages (mm Hg)	Risk Group A	Risk Group B	Risk Group C
High-normal (130–139/85–89)	Lifestyle modification	Lifestyle modification	Drug therapy* Lifestyle modification
Stage 1 (140–159/90–99)	Lifestyle modification (up to 12 months)	Lifestyle modification (up to 6 months)**	Drug therapy Lifestyle modification
Stages 2 and 3 (≥ 160/ ≥ 100)	Drug therapy Lifestyle modification	Drug therapy Lifestyle modification	Drug therapy Lifestyle modification

*For those with heart failure, renal insufficiency, or diabetes.
**For those with multiple risk factors, clinicians should consider drugs as initial therapy plus lifestyle modification.

Summary of Chapter 2

- Blood pressure classified as optimal, normal, high-normal, or stages 1, 2, or 3.
- Recommendations for detection, confirmation, and evaluation remain consistent with those in the JNC V report.
- In self-monitoring and ambulatory measurement, hypertension is now defined as SBP > 135 mm Hg and DBP > 85 mm Hg.

Summary of Chapter 2 (continued)

- New sections discuss genetics and clinical clues to identifiable causes of hypertension.
- New tables list cardiovascular risk factors and describe risk stratification.